

WHAT IS CLAIMED IS:

1. A system for dynamically assigning IP addresses to mobile stations in wireless networks including a plurality of base stations, comprising:

5 a wired IP network connecting the base stations;

an address server connected to the wired IP network; and

a proxy server at each base station in the wired IP network, said proxy server intercepting client-to-server requests for an IP address and modifying the request so that it goes only to the address server, and not to the other base stations, and intercepting server-to-client IP address messages from the address server and making sure that they are unicast only to the mobile stations requesting IP addresses.

2. The system of claim 1 operating according to a Dynamic Host Configuration Protocol (DHCP) and wherein the proxy server changes a hops field in a received DHCP client-to-server message so that the address server processes the message, but the proxy servers at other base stations discard the message.

3. The system of claim 2 wherein the hops field is set to zero if the message is from a mobile station and the proxy server changes it to a one when sending it on the wired IP network.

4. The system of claim 1 wherein the proxy server further includes a distribution table which stores information about mobile stations requesting IP addresses and sends server-to-client messages only to mobile stations listed in the table.

5. The system of claim 4 wherein the server-to-client message is unicast.

6. A method of dynamically assigning IP addresses to mobile stations in wireless networks including a plurality of base stations, comprising the steps of:

receiving at a base station proxy server an address request message from a mobile station requesting an IP address;

5 determining if the address request message is directly from the mobile station or from another base station over a wired network segment;

if the address request message is directly from a mobile station, altering the address request message and sending it over the wired network segment to an address server; and

10 if the address request message is from another base station, discarding the address request message.

7. The method of claim 6, further including the steps of:

receiving at a base station proxy server an address designation message;

15 determining from a Distribution Table which mobile stations within the range of the base station have requested address information; and

transmitting the address designation message only to those mobile stations identified.

20 8. The method of claim 7 wherein the step of transmitting is by unicasting.

9. The method of claim 6 wherein the wireless network is operating according to a Dynamic Host Configuration Protocol (DHCP) and wherein the step of altering the address request message comprises the step of changing a hops field in a received DHCP client-to-server message so that the address server processes the message, but the proxy servers at
25 other base stations discard the message.

10. A method of dynamically assigning IP addresses to mobile stations in wireless networks including a plurality of base stations, comprising the steps of:

receiving at a base station proxy server an address designation message;

determining from a Distribution Table which mobile stations within the
5 range of the base station have requested address information; and

transmitting the address designation message only to those mobile stations identified.

11. A system for dynamically assigning IP addresses to mobile stations in a wireless
10 network, said system comprising:

a plurality of base stations each of which serves a respective cell, each of said base stations including

a dynamic host configuration proxy (DHCP) server which determines whether a DHCP message can be unicast directly to a destination mobile station, and

a routing engine receiving a communication from said proxy server when
15 said DHCP message cannot be unicast directly to a destination mobile station, said routing engine including a Distribution Table which maintains a list of IP addresses to identify mobile stations requesting IP addresses, and said routing engine causing the unicasting over a radio channel to an address of the destination mobile station as identified by said
20 Distribution Table.

12. The system in accordance with claim 11 wherein said base station further comprises a second routing engine receiving communication from said proxy server when a DHCP message can be unicast directly to a destination mobile station.

13. A system for dynamically assigning IP addresses to mobile stations in a wireless network including a plurality of base stations defining cells into which the mobile stations migrate, each said base station comprising

a proxy server intercepting mobile-to-base station requests for an IP address and first and second routing engines for unicasting address messages only to mobile stations requesting an IP address.

5

14. The system in accordance with claim 13 wherein said first routing engine receives communication from said proxy server when the IP address can be directly unicast to a requesting mobile station and said second routing engine receives communications from said proxy server when an IP address can not be directly unicast to a requesting mobile station, said second routing engine including a Distribution Table containing a list of IP addresses identifying mobile stations to which an IP address may be unicast.

10

15. A system for dynamically assigning IP addresses to mobile stations in a wireless network including a plurality of base stations defining cells,

15

a wired network connecting said base stations and

a proxy server in each of said base stations, said proxy server identifying whether a message is received over the wired network from another base station and discarding said message, or received from a mobile station in the cell of the base station and causing an IP address to be unicast to that mobile station.

20

16. The system in accordance with claim 15 wherein said proxy server at a base station changes the hops field in received messages to determine whether a message is to be discarded or responded to.

25

17. The system in accordance with claim 16 wherein the proxy server further includes a Distribution Table which stores a table associating mobile stations with IP addresses and sends an IP address unicast message only to mobile stations listed in the table.

18. A method for dynamically assigning IP addresses to mobile stations in a wireless network, comprising the steps of:

receiving at a base station proxy server an address designation message;

5 determining from a Distribution Table which mobile stations within the range of the base station have requested address information and to which a unicast message can be sent; and

10 invoking a first routing engine when the address designation message cannot be unicast to the intended mobile station in order to direct the message to that mobile station; and

invoking a second routing engine when the address designation message can be unicast to the intended mobile station, which second routing engine unicasts the message over a radio channel to an address of the designated mobile station.

15 19. The method of claim 18 wherein the network uses dynamic host configuration proxy (DHCP) signaling.

20. The method of claim 19 wherein the messages have hop fields, and further comprising the steps of

20 receiving at a base station DHCP proxy server an address request message from a mobile station requesting an IP address;

determining if the address request message is directly from the mobile station or from another base station over a wired network segment;

25 if the address request message is directly from a mobile station, altering the hop field in the address request message and sending it over the wired network segment to an address server; and

if the address request message is from another base station, discarding the address request message.

transmitting the address designation message only to those mobile stations identified.